

## TOBACCO SMOKE EFFECTS

PARAMETER	TISSUE	SPECIES	EXP	TYPE	SOURCE	REMARKS
					1974, 20-E10	
globulin	serum	man	C	M	Gofin, 1982, 1042-A13	decrease in females
					Dales, 1974, 20-E10	decrease
					Pedersen, 1985, 1042-E9	decrease
	blood	man	C	M	Weiss, 1981, 428-F12	-
glucose	serum	man	C	M	Gofin, 1982, 1042-A13	no effect
glucose (fasting)	serum	man	C	M	Blackburn, 1960, -	increase
glucose conc.	serum	rat	B	M	Coggins, 1993, A2044	no effect
glucose-6-phosphatase	lung	rat	B	M	York, 1976, 216-G7	-
	lungs	rat	B	M	Latha, 1988, 1215-B12	increase
		rat	A	M	Chow, 1982, 1393-A12	increase; vitamin E
	heart	rat	B	M	Latha, 1988, 1215-B12	increase
glucosylases (repair enzymes)	leukocytes	man	C	M	Hall, 1993, D10051	increase
glucuronidation	liver	rat	C	M	Graziano, 1984, 214-A12	no effect

Remarks: Smoke type (TYPE): M: Mainstream, S: Sidestream  
Study type (EXP): A: acute, B: subchronic, C: chronic

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## TOBACCO SMOKE EFFECTS

PARAMETER	TISSUE	SPECIES	EXP	TYPE	SOURCE	REMARKS
glucuronyltransferase	lungs	rat	B	M	Gupta, 1986, 1319-D5	induction
	liver	rat	B	M	Gupta, 1986, 1319-D5	induction
		man	C	M	Fleischman, 1986, 1366-B2	increase
					Remmer, 1987, 1231-E3	induction (1-naphtol)
	lungs	rat	B	M	Gupta, 1986, 1319-D5	induction
glutathione	liver	rat	C	M	Graziano, 1984, 214-A12	-
	lung	rat	-	S	Bilimoria, 1989, -	SOT meeting
	kidneys	rat	-	S	Bilimoria, 1989, -	SOT meeting
	liver	rat	-	S	Bilimoria, 1989, -	SOT meeting
		guinea pig		S	Bilimoria, 1989, -	SOT meeting
	kidneys	guinea pig	-	S	Bilimoria, 1989, -	SOT meeting
	lung	guinea pig	-	S	Bilimoria, 1989, -	SOT meeting
	kidneys	guinea pig	-	M	Bilimoria, 1989, -	SOT meeting
	liver	guinea pig	-	M	Bilimoria, 1989, -	SOT meeting
		rat		M	Bilimoria, 1989, -	SOT meeting

Remarks: Smoke type (TYPE): M: Mainstream, S: Sidestream  
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## TOBACCO SMOKE EFFECTS

PARAMETER	TISSUE	SPECIES	EXP	TYPE	SOURCE	REMARKS
glutathione	kidneys	rat	-	M	Bilimoria, 1989, -	SOT meeting
	lung	rat	-	M	Bilimoria, 1989, -	SOT meeting
		rat	A	M	Chow, 1984, 479-D1	-
	erythrocyte	man	C	M	Pettigrew, 1972, 786-C10	-
	liver	guinea pig	A	M	Bilimoria, 1992, A672	decrease (MS type-dependent)
	kidneys	guinea pig	A	M	Bilimoria, 1992, A672	decrease (MS type-dependent)
	lungs	guinea pig	A	M	Bilimoria, 1992, A672	decrease (MS type-dependent)
	bladder	rat	A	M	Bilimoria, 1992, A672	no effect
	heart	rat	A	M	Bilimoria, 1992, A672	no effect
	liver	rat	A	M	Bilimoria, 1992, A672	no effect
	blood	rat	A	M	Bilimoria, 1992, A672	no effect
	kidneys	rat	A	M	Bilimoria, 1992, A672	decrease
	bladder	rat	A	S	Bilimoria, 1992, A672	decrease
	heart	rat	A	S	Bilimoria, 1992, A672	decrease
	liver	rat	A	S	Bilimoria, 1992, A672	decrease
	kidneys	rat	A	S	Bilimoria, 1992, A672	decrease
	lungs	rat	A	S	Bilimoria, 1992, A672	decrease

Remarks: Smoke type (TYPE): M: Mainstream, S: Sidestream  
Study type (EXP): A: acute, B: subchronic, C: chronic

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## TOBACCO SMOKE EFFECTS

PARAMETER	TISSUE	SPECIES	EXP	TYPE	SOURCE	REMARKS
					1992, A672	
glutathione	heart	guinea pig	A	M	Bilimoria, 1992, A672	no effect
	bladder	guinea pig	A	M	Bilimoria, 1992, A672	no effect
	blood	guinea pig	A	M	Bilimoria, 1992, A672	no effect
	heart	guinea pig	A	S	Bilimoria, 1992, A672	no effect
	bladder	guinea pig	A	S	Bilimoria, 1992, A672	no effect
	liver	guinea pig	A	S	Bilimoria, 1992, A672	no effect
	kidneys	guinea pig	A	S	Bilimoria, 1992, A672	no effect
	lungs	guinea pigs	A	S	Bilimoria, 1992, A672	decrease
		rat		M	Bilimoria, 1992, A672 Chow, 1982, 1393-A12	decrease; increase; vitamin E
		rat	B	M	Gupta, 1986, 1319-D5	increase
glutathione concentration	liver	rat	B	M	Gupta, 1986, 1319-D5	no effect
	lavage fluid	rat	A	M	Cotgreave, 1987, 939-C5	decrease
	lung	rat	A	M	Cotgreave, 1987, 939-C5	decrease
	liver	rat	B	M	Gupta, 1986, 1319-D5	induction

Remarks: Smoke type (TYPE): M: Mainstream, S: Sidestream  
 Study type (EXP): A: acute, B: subchronic, C: chronic

## TOBACCO SMOKE EFFECTS

PARAMETER	TISSUE	SPECIES	EXP	TYPE	SOURCE	REMARKS
glutathione concentration	lavage cells	rat	A	M	Cotgreave, 1987, 939-C5	decrease
	erythrocytes	man	C	M	Costagliola, 1989, 1372-B6	induction
	liver	rat	A	M	Gupta, 1986, 1319-D5	decrease
		rat	B	M	Gupta, 1986, 1319-D5	no effect
glutathione conjugation	liver	rat	C	M	Graziano, 1984, 214-A12	no effect
glutathione content	liver	rat	B	M	Gupta, 1988, 1215-A8	no effect
	lungs	rat	B	M	Gupta, 1988, 1215-A8	increase
glutathione peroxidase	lung	rat	B	M	York, 1976, 216-G7	-
	liver	rat	B	M	Gupta, 1988, 1215-A8	no effect
	lung	rat	A	M	Chow, 1984, 479-D1	-
	lungs	rat	A	M	Chow, 1982, 1393-A12	increase; vitamin E
		rat	B	M	Gupta, 1988, 1215-A8	no effect
glutathione reductase	lung	rat	B	M	York, 1976,	-

Remarks: Smoke type (TYPE): M: Mainstream, S: Sidestream  
Study type (EXP): A: acute, B: subchronic, C: chronic

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## TOBACCO SMOKE EFFECTS

PARAMETER	TISSUE	SPECIES	EXP	TYPE	SOURCE	REMARKS
					216-G7	
glutathione reductase	liver	rat	B	M	Gupta, 1988, 1215-A8	no effect
	lung	rat	A	M	Chow, 1984, 479-D1	-
	lungs	rat	A	M	Chow, 1982, 1393-A12	increase; vitamin E
		rat	B	M	Gupta, 1988, 1215-A8	no effect
	BALF	rat	B	M	Mauderly, 1989, D235	increase
glutathione-S -transferase	lungs	man	C	M	Petruzzelli, 1988, 1206-E10	decrease
	liver	rat	B	M	Gupta, 1986, 1319-D5	decrease
	lungs	rat	B	M	Gupta, 1986, 1319-D5	decrease
	liver	rat	B	M	Gupta, 1986, 1319-D5	no effect
	lungs	rat	A	M	Chow, 1982, 1393-A12	increase; vitamin E
	kidneys	rat	A	M	Chow, 1982, 1393-A12	no effect; vitamin E
	liver	rat	A	M	Gupta, 1986, 1319-D5	no effect
		rat	B	M	Gupta, 1986,	no effect

Remarks: Smoke type (TYPE): M: Mainstream, S: Sidestream  
 Study type (EXP): A: acute, B: subchronic, C: chronic

## TOBACCO SMOKE EFFECTS

PARAMETER	TISSUE	SPECIES	EXP	TYPE	SOURCE	REMARKS
					1319-D5	
glutathione-S -transferase activity	lungs	man	C	M	Pasquini, 1988, 1333-F4	no effect
glutathione transferase	liver	rat	B	M	Graziano, 1984, 214-A12	no effect
granulation	macrophag e	rat	C	M	Drath, 1980, 804-B14	lipid inclusions
granulocytes	blood	man	A	E	Hockertz, 1993, Titisee	increase
GSSG/GSH ratio	erythrocy tes	man	C	M	Costagliol a, 1989, 1372-B6	no effect
haematocrit	blood	man	C	M	Lowe, 1985, 1075-F7	increase
haemoglutinei c, haemolytic antibodies	spleen	mouse	C	M	Thomas, 1974, 288-G1	-
haptoglobin	blood	man	C	M	Weiss, 1981, 428-F12 Wolf, 1982, 428-G5	- -
haptoglobulin	blood	man	C	M	Thabaut, 1976, 459-B12	-
HDL apoprotein A1 concentration	plasma	pigeon	A	M	Mulligan, 1981, -	decrease
HDL cholesterol concentration	plasma	pigeon	A	M	Mulligan, 1981, -	no effect
heart rate	-	man	A	E	McMurray, 1985,	increase

Remarks: Smoke type (TYPE): M: Mainstream, S: Sidestream  
Study type (EXP): A: acute, B: subchronic, C: chronic

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## TOBACCO SMOKE EFFECTS

PARAMETER	TISSUE	SPECIES	EXP	TYPE	SOURCE	REMARKS
					D9126	
heart weight	heart	rat	B	M	Coggins, 1993, A2044	varying effect
hematocrit	blood	rat	B	M	Coggins, 1993, A2044	no effect
		rat	A	M	Chow, 1982, 1393-A12	increase; vitamin E
hemoglobin	blood	rat	A	M	Chow, 1982, 1393-A12	increase; vitamin E
		rat	B	M	Coggins, 1993, A2044	no effect
hemoglobin concentration	erythrocytes	man	C	M	Costagliola, 1989, 1372-B6	no effect
hemorrhage	chorioallantoic	chicken	A	M	Comber, 1973, 41-A1	condensate
histidine requirement	-	Salmonella	A	M	Kier, 1974, 40-A1	nitrate effects
HMG-CoA reductase	heart	rat	B	M	Latha, 1988, 1215-B12	increase
	liver	rat	B	M	Latha, 1988, 1215-B12	increase
	lungs	rat	B	M	Latha, 1988, 1215-B12	increase
HPB globin adduct	blood	man	C	M	Carmella, 1990, 1446-A11	increase in 20 % of pop.
HPRT mutation	lymphocyte	man	C	M	Ammenheuser	increase (also in

Remarks: Smoke type (TYPE): M: Mainstream, S: Sidestream  
Study type (EXP): A: acute, B: subchronic, C: chronic

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## TOBACCO SMOKE EFFECTS

PARAMETER	TISSUE	SPECIES	EXP	TYPE	SOURCE	REMARKS
	es				r, 1994, A2365	newborns)
humoral immunity	blood	mouse	-	M	Thomas, 1975, 13-K19 Thomas, 1973, 13-K16	-
	lymph node	mouse	-	M	Thomas, 1973, 13-K16	-
	lung	mouse	-	M	Thomas, 1973, 13-K16	-
	spleen	mouse	-	M	Thomas, 1973, 13-K16	-
	blood	mouse	-	M	Holt, 1976, 822-C10	-
	lung	rat	C	M	Gregson, 1981, 20-K6	-
	spleen	mouse	-	M	Thomas, 1975, 13-K19	-
hydroxyprolin e	urine	human	C	M	Adlkofer, 1985, 812-A1	-
hyperplasia	larynx	hamster	B	M	Harada, 1984, 809-B14	-
	chorioall antoic	chicken	A	M	Comber, 1973, 41-A1	condensate
	nose	rat	B	M	Coggins, 1993, A2044	resp. epithelium
	lungs	rat	B	M	Coggins,	not seen

Remarks: Smoke type (TYPE): M: Mainstream, S: Sidestream  
Study type (EXP): A: acute, B: subchronic, C: chronic

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## TOBACCO SMOKE EFFECTS

PARAMETER	TISSUE	SPECIES	EXP	TYPE	SOURCE	REMARKS
					1993, A2044	
hyperplasia	trachea	rat	B	M	Coggins, 1993, A2044	-
Ig	blood	man	-	M	Ferson, 1979, 428-A11	-
	skin	man	-	M	Romanski, 1981, 804-F1 Warren, 1982, 811-G8	- -
	blood	man	-	M	Cederqvist , 1984, 428-A7	-
	lung	rat	C	-	Gregson, 1981, 20-K6	bronchi
	blood	man	-	M	Stein, 1983, 437-F9 Warren, 1982, 811-G8 Romanski, 1981, 804-F1	- - -
	lung	man	-	M	Gregson, 1981, 20-K6	-
	blood	man	-	M	Gerrard, 1980, 804-D5	-
IgA	blood	man	-	M	Onari, 1978, 18-B26	-
		man	C	M	Andersen, 1982, 101-A1	-

Remarks: Smoke type (TYPE): M: Mainstream, S: Sidestream  
Study type (EXP): A: acute, B: subchronic, C: chronic

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## TOBACCO SMOKE EFFECTS

PARAMETER	TISSUE	SPECIES	EXP	TYPE	SOURCE	REMARKS
IgA	blood	man	C	M	Ferson, 1979, 428-A11	-
IgE	-	man	C	M	Warren, 1982, 811-G8 Stein, 1983, 437-F9	- -
	blood	man	C	M	Burrows, 1981, TS 024	-
	-	man	C	M	Zetterstro em, 1981, 437-G6	-
IgG	blood	man	-	M	Onari, 1978, 18-B26	-
		man	C	?	Andersen, 1982, 101-A1	-
IgM	blood	man	C	M	Cederqvist , 1984, 428-A7	-
immune response to transplanted tumors	-	mouse	C	M	Chalmer, 1975, 804-A13  Thomas, 1975, 13-K19 Holt, 1976, 822-C10	- - -
immunity	lymph node	mouse	-	M	Thomas, 1975, 13-K19	-
interferon	L-929 cells	mouse	A	S	Sonnenfeld , 1986, 662-E12	-
interleukin 1	macrophag	man	C	M	Brown,	decrease

Remarks: Smoke type (TYPE): M: Mainstream, S: Sidestream  
Study type (EXP): A: acute, B: subchronic, C: chronic

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## TOBACCO SMOKE EFFECTS

PARAMETER	TISSUE	SPECIES	EXP	TYPE	SOURCE	REMARKS
release	e				1988, 1189-A1	
interleukins	blood	man	A	E	Hockertz, 1993, Titisee	no change
intracellular communication	cell culture	rat	-	M	McKarns, 1990, -	smoking article comparison
		human		M	McKarns, 1990, -	smoking article comparison
iron content	macrophag e alv.	man	C	M	Rich, 1988, 1308-E11	increase
kidney weight	kidney	rat	B	M	Coggins, 1993, A2044	decrease
lactate	blood	man	A	E	McMurray, 1985, D9126	increase
lactate dehydrogenase	BALF	rat	B	M	Mauderly, 1989, D235	increase
	blood	rat	A	M	Chow, 1982, 1393-A12	no effect; vitamin E
larynx tumors	-	man	C	M	Mathe, 1988, 1316-F4	epidemiology
LDL concentration	blood	man	C	M	Princen, 1992, -	no difference
leucocyte, number	blood	man	C	M	Petersen, 1983, 341-D14	-
	BAL	mouse	C	M	Kew, 1987, 977-B9	increase
	blood	man	C	-	Zalokar, 1981, 269-F11 Noble, 1975,	-

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## TOBACCO SMOKE EFFECTS

PARAMETER	TISSUE	SPECIES	EXP	TYPE	SOURCE	REMARKS
					18-B20	
leucocytes	blood	man	-	M	Sparrow, 1984, 817-D4	-
leukocyte count	blood	rat	B	M	Coggins, 1993, A2044	no effect
leukotriene	BALF	rabbit	A	M	Witten, 1988, 1350-F11	decrease
leukotriene synthesis	macrophag e	rat	B	M	Mobley, 1987, TS 036	decrease
LH	serum	rat	A	M	Andersson, 1987, 1024-A1	no effect
lipid peroxidation	liver	rat	B	M	Gupta, 1988, 1215-A8	no effect
lipid peroxidation	-	man	C	M	Shariff, 1988, 1195-E8	pentane extraction, vit. E
	lungs	rat	B	M	Gupta, 1988, 1215-A8	increase
lipid peroxides	plasma	man	C	M	Pre, 1989,	increase
liver weight	liver	rat	B	M	Coggins, 1993, A2044	decrease
longevity	-	mouse	C	M	Campbell, 1936, D7536	increase
		rat		M	Wehner, 1981, 15-N21	no effect
		hamster		M	Wehner, 1976,	increase

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## TOBACCO SMOKE EFFECTS

PARAMETER	TISSUE	SPECIES	EXP	TYPE	SOURCE	REMARKS
					D7543	
lung clearance	-	man	C	M	Huchon, 1984, D8689	increase (Tc-DTPA)
		rat	B	M	Minty, 1985, D8691	increase (Tc-DTPA) (reversible)
		rabbit	A	M	Witten, 1985, D8688	increase (Tc-DTPA)
		man	C	M	Minty, 1981, D8692	increase (Tc-DTPA) (reversible)
lung function	-	man	A	E	Magnussen, 1993, Titisee	impairment of asthma
lung tumors	-	man	C	M	Mathe, 1988, 1316-F4	epidemiology
luteinizing hormone	serum	rat	A	M	Andersson, 1988, 1054-A1	decrease
lymphocyte concentration	BALF	rabbit	A	M	Witten, 1988, 1350-F11	decrease
lysosomal activity	macrophage	man	-	M	Martin, 1973, 198-A8	-
		rat		M	Barry, 1972, 298-A2	-
lysozyme activity	macrophage	rat	C	M	Gregson, 1981, 20-K6	-
macrophage activity	lung lavage	man	C	M	Hubbard, 1987, 1226-C8 Hubbard, 1987, -	increased H2O2 production increased H2O2 production

Remarks: Smoke type (TYPE): M: Mainstream, S: Sidestream  
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## TOBACCO SMOKE EFFECTS

PARAMETER	TISSUE	SPECIES	EXP	TYPE	SOURCE	REMARKS
macrophage, number	-	man	C	M	Ando, 1984, 819-A7	-
		hamster	B	M	Harada, 1984, 809-B14	-
		man	C	M	Fisher, 1982, 68-A1	-
macrophage, size	-	rat	C	M	Drath, 1980, 804-B14	-
macrophage, vacuolization	lung	mouse	C	M	Matulionis , 1984, 348-C11	-
macrophages	lungs	rat	B	M	Coggins, 1993, A2044	pigmented
magnesium concentration	blood	man	C	M	Sulsky, 1988, 1195-F14	decrease
malanodialdehy de (MDA)	serum	man	C	M	Nadiger, 1987, 1048-E11	lipid peroxidation marker
malondialdehy de	blood	man	C	M	Kalra, 1991, 1592-D13	increase (TBA method)
	serum	man	C	M	Kalra, 1991, 1592-D13	increase (TBA method)
mast cell density	resp. epithel.	man	-	M	Lamb, 1982, 818-E7	-
mast cells	lung	monkey	-	M	Walter, 1982, 819-G10	-
metaplasia	larynx	rat	B	M	Coggins, 1993,	keratinizing

Remarks: Smoke type (TYPE): M: Mainstream, S: Sidestream  
Study type (EXP): A: acute, B: subchronic, C: chronic

## TOBACCO SMOKE EFFECTS

PARAMETER	TISSUE	SPECIES	EXP	TYPE	SOURCE	REMARKS
					A2044	
metaplasia, squamous	nose	rat	B	M	Coggins, 1993, A2044	not seen
micronuclei	bone marrow	mouse	B	M	Lee, 1990, -	smoking article comparison
monoamino oxidase (MAO) activity	lung	man	C	M	Sass, 1989, -	inhibition in vitro
monocyte expression	monocytes	man	C	M	Ziegler-Heitbrock, 1988, 1189-G11	unaltered
morphometry	lungs	hamster	A	M	Takada, 1988, 1073-F1	synergist. effect with bleomyc
mortality	-	rat	B	-	Binns, 1978, 20-C18	-
mucous cell metaplasia	lungs	man	C	E	Trichipoulos, 1992, -	-
mutagenicity	urine	man	C	M	van Doorn, 1979, 41-F3 Sirtori, 1978, nd Yamasaki, 1977, 346-G8 Dolara, 1981, 93-C5 Putzrath, 1981, 13-F13 Aeschbacher, 1981, 93-A1 Schenker, 1988, 1189-D14 Schenker, 1985, -	- - - - - - increase - -

Remarks: Smoke type (TYPE): M: Mainstream, S: Sidestream  
Study type (EXP): A: acute, B: subchronic, C: chronic



## TOBACCO SMOKE EFFECTS

PARAMETER	TISSUE	SPECIES	EXP	TYPE	SOURCE	REMARKS
					552-G12	
mutagenicity	urine	rat	A	S	Mohtashami - pur, 1984, 354-E12	
				M	Mohtashami - pur, 1984, 354-E12	
		man	C	M	Gellbart, - 1980, 804-C14	
		human	A	M	Rahn, 1991, 1603-F8	Premier
N-nitrosodime thylamine	lungs	man	C	M	Pasquini, 1988, 1333-F4	no effect
NADPH cytochrome c reductase	liver	man	C	M	Remmer, 1987, 1231-E3	no effect
natural killer cells	blood	man	A	E	Hockertz, 1993, Titisee	increase
NDMA demethylase	lung	rat	A	M	Pasquini, 1987, 1154-D1	no effect (MWSC, SWSC i. p.)
				S	Pasquini, 1987, 1154-D1	no effect (MWSC, SWSC i. p.)
	liver	rat	A	S	Pasquini, 1987, 1154-D1	no effect (MWSC, SWSC i. p.)
				M	Pasquini, 1987, 1154-D1	no effect (MWSC, SWSC i. p.)
necrosis	chorioall antoic	chicken	A	M	Comber, 1973, 41-A1	condensate
nicotine	plasma	rat	B	M	Coggins,	-

Remarks: Smoke type (TYPE): M: Mainstream, S: Sidestream  
Study type (EXP): A: acute, B: subchronic, C: chronic

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## TOBACCO SMOKE EFFECTS

PARAMETER	TISSUE	SPECIES	EXP	TYPE	SOURCE	REMARKS
					1993, A2044	
nicotine concentration	plasma	rat	B	M	Mauderly, 1989, D235	-
	urine	rat	B	M	Mauderly, 1989, D235	-
nitrosoprolin e excretion	urine	man	C	M	Wogan, 1989, 1500-G3	increase
NK cell activity	blood	man	-	M	Ferson, 1979, 428-A11	-
	spleen	monkey	C	M	Sopori, 1985, 640-F9	decrease
NNAL (- glucuronide)	urine	man	A	S	Hecht, 1993, D10581	-
		man	C	M	Carmella, 1993, 1698-C12	-
NNK-derived globin adduct	blood	man	C	M	Richter, 1993, poster Falter, 1993, Titisee	marginal increase over background  also in nonsmokers
noradrenaline	heart	rabbit	B	M	Hirokawa, 1991, DB747	increase; only nicotine-len cig.
	adrenals	rabbit	B	M	Hirokawa, 1991, DB747	increase; also nicotine-len cig.
NTB reduction e	macrophag e	man	C	M	Ando, 1984, 819-A7	-
O6-methyldeox yguanosine	placenta	man	C	M	Foiles, 1988, 2739-?	no effect

Remarks: Smoke type (TYPE): M: Mainstream, S: Sidestream  
Study type (EXP): A: acute, B: subchronic, C: chronic

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## TOBACCO SMOKE EFFECTS

PARAMETER	TISSUE	SPECIES	EXP	TYPE	SOURCE	REMARKS
O6-methylguan ine-DNA methyltransfe rase	free lung cells	man	C	M	Vaehaekang as, 1991,	no effect
O6-methylguan ine-methyltra nsferase	leukocyte	man	C	M	Hall, 1993, D10051	no effect
O6-methyltran sferase	placenta	man	C	M	Foiles, 1988, 2739-?	no effect
okt4+/okt8+	-	man	C	M	Miller, 1982, 817-C3	-
	blood	man	C	M	Miller, 1982, 817-C3	-
oral tumors	-	man	C	M	Mathe, 1988, 1316-F4	epidemiology
organ weight	lungs	rat	A	M	Chow, 1982, 1393-A12	no effect, vitamin E
oxidative phosphorylati on	mitochond ria,	-	-	-	Kyle, 1970, -	lung, cited in FEP 75/2, p.389
	heart	rabbit	A	S	Gvozdjakov a, 1984, D9128	impairment
		rabbit	B	S	Gvozdjakov a, 1984, D9128	impairment
oxygen consumption	macrophag e	rat	C	M	Drath, 1980, 804-B14	-
p53 mutation	lung tumor	man	C	M	Ryberg, 1993, abstract	frequency increased
P53 mutation	bladder	man	C	M	Spruck,	no increase but

Remarks: Smoke type (TYPE): M: Mainstream, S: Sidestream  
Study type (EXP): A: acute, B: subchronic, C: chronic

## TOBACCO SMOKE EFFECTS

PARAMETER	TISSUE	SPECIES	EXP	TYPE	SOURCE	REMARKS
	tumor				1993,	double mutations
P53 mutation	lung tumor	man	C	M	Chiba, 1990, D8788 Suzuki, 1992, A538	no effect (NSCLC) increase (OR = 5) (NSCLC)
	bladder tumor	man	C	M	Habadini, 1993, A2066	no increase (different pattern?)
p53 overexpression	bladder tumor	man	C	M	Zhang, 1993, abstract	frequency increased
PAH excretion	urine	man	C	M	Becker, 1983, TS 040	B(a)P metabolites
particle clearance half-time	lungs	rabbit	A	M	Witten, 1988, 1350-F11	decrease
pentobarbital - sleeping time		rat	C	M	Grazians, 1984, 214-A12	no change
permeability of bronchial mucosa	lung	guinea pig	-	M	Hulbert, 1980, 533-B13	-
phagocyte chemoluminescence	plasma	man	C	M	van Rensburg, 1989, 1395-G7	increase
phagocytosis	PMN, peritoneal	mouse	C	M	Keast, 1983, 803-B9	complement, killing
	lung	man	C	M	Fisher, 1982, 68-A1	-
	macrophage	rat	C	M	Drath, 1980, 804-B14	-
	lung lavage	man	C	M	Jonsson, 1987, -	no effect

Remarks: Smoke type (TYPE): M: Mainstream, S: Sidestream  
Study type (EXP): A: acute, B: subchronic, C: chronic

## TOBACCO SMOKE EFFECTS

PARAMETER	TISSUE	SPECIES	EXP	TYPE	SOURCE	REMARKS
phagocytosis	alveolar macrophages	rat	B	M	Fogelmark, 1980, 210-B4	increase
		man	C	M	Harris, 1970, 56-B14	no effect
		rat	S	S	P 0500/3123, -	increase
				M	P 0500/3108, -	increase
		hamster	B	M	Fogelmark, 1980, 210-B4	increase
		man	C	M	King, 1988, 11501	no effect
phagocytosis of tobacco antigens	blood	man	C	-	Romanski, 1984, 428-F3	-
phagolysosome fusion	macrophage	rat	B	M	Harris, 1984, 348-B5	-
pharmacokinetics, diverse	whole body	man	C	M	Miller, 1989, 1346-D8	multiple (review)
phenacetin o-deethylase	liver	man	C	M	Sesardic, 1988, 1277-D4	increase
phospholipids	lipoprotein	rat	B	M	Latha, 1988, 1215-B12	increase
	lung	rat	B	M	Latha, 1988, 1215-B12	increase
	aorta	rat	B	M	Latha, 1988,	increase

Remarks: Smoke type (TYPE): M: Mainstream, S: Sidestream  
 Study type (EXP): A: acute, B: subchronic, C: chronic

## TOBACCO SMOKE EFFECTS

PARAMETER	TISSUE	SPECIES	EXP	TYPE	SOURCE	REMARKS
					1215-B12	
phospholipids	heart	rat	B	M	Latha, 1988, 1215-B12	increase
phosphorus conc.	serum	rat	B	M	Coggins, 1993, A2044	no effect
physiology	lungs	rat	B	M	Lai, 1987, 1100-D14	high vs. low nic., synerg.elas
plaque formation	-	mouse	C	M	Thomas, 1975, 13-K19 Thomas, 1974, 288-G1	-
plasma osmolality	blood	man	C	M	Lambert, 1983, 469-E2	no effect
platelet adhesion, aggregation	blood	rat	-	M	Reese, 1975, 22-L23	-
		rat	C	M	Mikhail, 1979, 196-G10	increase
		?	-	M	Levine, 1973, 158-C11	-
platelet aggregation	blood	man	C	S	Davis, 1989, 1301-B11	decrease
	heart	dog	A	M	Gering, 1990, -	increase (also PREMIER)
	blood	man	C	M	Davis, 1985, D9131	-
platelet count	blood	rat	B	M	Coggins, 1993, A2044	no effect

Remarks: Smoke type (TYPE): M: Mainstream, S: Sidestream  
Study type (EXP): A: acute, B: subchronic, C: chronic

## TOBACCO SMOKE EFFECTS

PARAMETER	TISSUE	SPECIES	EXP	TYPE	SOURCE	REMARKS
PMN, number	BAL	mouse	C	M	Kew, 1987, 977-B9	increase
PMNL	BALF	rat	B	M	Mauderly, 1989, D235	increase
postlabeling adducts	placenta	man	C	M	Wogan, 1989, 1500-G3	-
	bronchus	man	C	M	Wogan, 1989, 1500-G3	-
	oral mucosa	man	C	M	Wogan, 1989, 1500-G3	increase
	larynx	man	C	M	Wogan, 1989, 1500-G3	-
potassium	serum	man	A	M	Larson, 1961, tob11/1b	transient decrease
potassium conc.	serum	rat	B	M	Coggins, 1993, A2044	no effect
prenatal toxicity	-	man	-	M	Barrett, 1981, 191-L9	-
primary and secondary response to SRBC	-	mouse	C	M	Thomas, 1973, 13-K16	-
prolactin	serum	rat	A	M	Andersson, 1987, 1024-A1 Andersson, 1988, 1054-A1	no effect decrease
prostacyclin	BALF	rabbit	A	M	Witten, 1988, 1350-F11	increase
	plasma	rabbit	A	M	Witten,	increase

Remarks: Smoke type (TYPE): M: Mainstream, S: Sidestream  
Study type (EXP): A: acute, B: subchronic, C: chronic

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## TOBACCO SMOKE EFFECTS

PARAMETER	TISSUE	SPECIES	EXP	TYPE	SOURCE	REMARKS
					1988, 1350-F11	
prostacyclin synthesis	vasc. endothel.	man	C	M	Nowak, 1987, -	induction
prostaglandin synthesis	macrophag e	rat	B	M	Mobley, 1987, TS 036	no effect
prostaglandin s	lung	hamster	-	M	Uotila, 1980, 13-L5	increase
	blood	man	A	E	Hockertz, 1993, Titisee	no change
prostaglandin s E2 and F2 Alpha	lung maccroph.	rabbit	-	S	Gunnison, 1989, -	SOT meeting
protein	serum	rat	B	M	Coggins, 1993, A2044	no effect
protein (cytosol)	lungs	rat	A	M	Chow, 1982, 1393-A12	no effect, vitamin E
protein synthesis	lung	mouse	-	M	Sershen, 1981, 13-I21	-
	brain	rat	-	M	Garrett, 1978, 25-G1	339-A13
	lung	rat	-	M	Garrett, 1978, 25-G1	-
	liver	mouse	-	M	Sershen, 1981, 13-I21	-
	brain	mouse	-	M	Sershen, 1981, 13-I21	-
	liver	rat	-	M	Garrett, -	-

Remarks: Smoke type (TYPE): M: Mainstream, S: Sidestream  
Study type (EXP): A: acute, B: subchronic, C: chronic

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## TOBACCO SMOKE EFFECTS

PARAMETER	TISSUE	SPECIES	EXP	TYPE	SOURCE	REMARKS
					1979, 339-A13	
protein synthesis	brain	mouse	A	M	Sershen, 1981, 13-I21	decrease
	liver	mouse	A	M	Sershen, 1981, 13-I21	decrease
protein synthesis, macrophage	lung	-	-	-	Yeager, 1969, -	cited in FEP 75/2, p. 395
	-	-	-	-	Holt, 1973, 23-G20	-
	lung	-	-	-	Low, 1974, - B 072	
pyruvate kinase	blood	rat	A	M	Chow, 1982, 1393-A12	no effect; vitamin E
ras oncoprotein	plasma	man	C	M	Brinkworth , 1992, 1685-A1	no effect
ras-G1-mutations	larynx	man	C	M	Stern, 1993, D10047	-
red cell count	blood	rat	A	M	Chow, 1982, 1393-A12	increase; vitamin E
reduction of alveolar space	lung	mouse	C	M	Matulionis , 1984, 348-C11	-
respiration rate	-	rat	B	-	Binns, 1978, 20-C18	decrease
respiratory burst	alveolar macrophages	rat	B	M	Drath, 1978, 10-D5	increase (superoxide, hydrogen peroxide)
		man	C	M	Sugimoto,	increased

Remarks: Smoke type (TYPE): M: Mainstream, S: Sidestream  
Study type (EXP): A: acute, B: subchronic, C: chronic

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## TOBACCO SMOKE EFFECTS

PARAMETER	TISSUE	SPECIES	EXP	TYPE	SOURCE	REMARKS
					1985, 540-G3	superoxide production
respiratory physiology	lungs	man	C	M	Xu, 1992,	decrease; men > woman
	-	rat	B	M	Mauderly, 1989, D235	small effects
		man	C	M	Gillissen, 1989, 1301-C9	slight impairment
retinol concentration	blood	man	C	M	Sulsky, 1988, 1195-F14	decrease
S9 protein concentration	lung	rat	A	M	Gupta, 1987, 1195-C11	no effect
SCE	blood	man	-	M	Wulf, 1983, 75-G8 Huettnner, 1980, 178-D5	- -
	bone marrow	mouse	B	M	Lee, 1990, -	smoking article comparison
	lymphocyt es	man	C	M	van Rensburg, 1989, 1395-G7	no effect
	bone marrow	mouse	B	M	Benedict, 1984, 175-C8	-
	lymphocyt e	man	C	M	Turanitz, 1981, 184-C2 Husum, 1981, 178-E9 Carrano, 1981, 175-E13 Maeki-Paak kanen,	blood blood blood blood

Remarks: Smoke type (TYPE): M: Mainstream, S: Sidestream  
Study type (EXP): A: acute, B: subchronic, C: chronic

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## TOBACCO SMOKE EFFECTS

PARAMETER	TISSUE	SPECIES	EXP	TYPE	SOURCE	REMARKS
SCE	lymphocyte	man	C	M	1980, 181-E5 Husgafvel-Pursiainen , 1980, 177-E5 Hopkin, 1980, 177-C14 Valadaud-B arrieu, 1979, 184-C9 Murthy, 1979, 182-A8 Lambert, 1978, 178-G9	blood    blood  blood  blood  blood
	blood	man	-	M	Lambert, 1980, 19-I27	-
secretory cells hyperplasia	trachea	rat	B	M	Rogers, 1988, 1159-E9	recovery with N-acetylcysteine
	lungs	rat	B	M	Rogers, 1988, 1159-E9	recovery with N-acetylcysteine
sister chromatid exchange	lymphocytes	man	C	M	Perera, 1991, 1574-D2 Brinkworth , 1992, 1685-A1	increase  no effect
sister chromatid exchange	lymphocytes	man	C	E	Gorgels, 1992, A909	no effect
skin lesions over nasal bones	skin	mouse	C	M	Matulionis , 1984, 348-C11	-
sodium	urine	man	C	M	Lambert, 1983, 469-E2	no effect

Remarks: Smoke type (TYPE): M: Mainstream, S: Sidestream  
Study type (EXP): A: acute, B: subchronic, C: chronic

## TOBACCO SMOKE EFFECTS

PARAMETER	TISSUE	SPECIES	EXP	TYPE	SOURCE	REMARKS
sodium conc.	serum	rat	B	M	Coggins, 1993, A2044	no effect
sperm abnormalities	sperm	man	C	M	Evans, 1981, 478-B5	-
squamous metaplasia	lungs	man	C	M	Trichopoul os, 1992, -	-
superoxide dismutase	liver	rat	B	M	Gupta, 1988, 1215-A8	increase
	lungs	rat	B	M	Gupta, 1988, 1215-A8	no effect
superoxide release	macrophag e	rat	C	M	Drath, 1980, 804-B14	-
surfactant	lung	man	-	M	Finley, 1972, 95-C5	-
		?		M	Le Mesurier, 1979, 14-J21	-
		rat	B	M	Jones, 1973, 459-A10	-
		man	-	M	Kollerstro m, 1977, 9-C6	-
surfactant synthesis	lungs	dog	B	M	Giammona, 1971, D8693	no change
surfactant tension	lungs	rat	A	M	Miller, 1962, D8695	decrease (also in vitro)
surfactant tension	lungs	dog	B	M	Giammona, 1971,	no change

Remarks: Smoke type (TYPE): M: Mainstream, S: Sidestream  
Study type (EXP): A: acute, B: subchronic, C: chronic

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## TOBACCO SMOKE EFFECTS

PARAMETER	TISSUE	SPECIES	EXP	TYPE	SOURCE	REMARKS
(Wilhelmy)					D8693	
surfactant volum	lungs	man	C	M	Finley, 1972, D8694	decrease (no changed lipid pattern)
T lymphocyte, number	lung	man	-	M	Daniele, 1977, 226-E7	-
	blood	man	-	M	Ginns, 1982, 210-B12	-
					Miller, 1982, 817-C3	-
T lymphocyte, stimulation	lung	man	-	M	Daniele, 1977, 226-E7	-
	spleen	moneky	C	M	Sopori, 1985, 640-F9	decrease, ConA
	-	mouse	-	M	Keast, 1981, 831-F2	-
	blood	man	-	M	Petersen, 1983, 341-D14	-
	lung	rat	-	M	Gregson, 1981, 20-H13	-
	thymus	man	-	M	Silverman, 1975, 341-G6	-
T lymphocytes	blood	man	A	E	Hockertz, 1993, Titisee	changed composition
T lymphocytes, number	blood	man	-	M	Ginns, 1983, 803-A13	-
tear secretion	eye	human	A	M	Marquardt, 1986,	decrease

Remarks: Smoke type (TYPE): M: Mainstream, S: Sidestream  
Study type (EXP): A: acute, B: subchronic, C: chronic

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## TOBACCO SMOKE EFFECTS

PARAMETER	TISSUE	SPECIES	EXP	TYPE	SOURCE	REMARKS
					757-E5	
tear secretion	eye	human	A	S	Marquardt, 1986, 757-E5	decrease
teratogenicity	-	rat	-	-	Reckzeh, G., 1975, 619-F6	-
thickening of alveolar septa	lung	mouse	C	M	Matulionis, 1984, 348-C11	-
thiobarbituric acid reactive substances	lungs	rat	A	M	Chow, 1982, 1393-A12	no effect; vitamin E
thiocyanate	serum	man	C	M	Wagenknecht, 1990, D2160	monitor
	unbilical blood	man	C	M	Manchester, 1981, D10813	increase
				E	Manchester, 1981, D10813	no effect
thioether	urine	rat	C	M	Graziano, 1984, 214-A12	-
		man		M	van Doorn, 1979, 41-F3 Bos, 1992, D7417 Heinonen, 1983, 590-A13	- decrease by carotene -
thioether excretion	urine	man	C	M	Karakaya, 1989, -	increase
thromboplastin activity	blood	rat	-	M	Mikhail, 1979, 196-G10	-

Remarks: Smoke type (TYPE): M: Mainstream, S: Sidestream  
 Study type (EXP): A: acute, B: subchronic, C: chronic

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## TOBACCO SMOKE EFFECTS

PARAMETER	TISSUE	SPECIES	EXP	TYPE	SOURCE	REMARKS
thromboxane B2	lung macroph.	rabbit	-	S	Gunnison, 1989, -	SOT meeting
thromboxane synthesis	macrophag e	rat	B	M	Mobley, 1987, TS 036	no effect
tidal volume	-	rat	B	-	Binns, 1978, 20-C18	increase
toluene clearance	-	man	C	M	Hhelm, 1988, -	induction
toluene concentration	blood	man	C	M	Hajimiragh a, 1989, 1368-E10	increase
transferrin	serum	man	C	M	Galdston, 1987, 1323-B12	no effect
transformatio n	trachea	rat	B	M	Thomassen, 1989, 1322-F9 Mauderly, 1989, D235	ex vivo -
trigeminal activity	trachea	rat	A	M	Gepetti, 1993, Br.J.Ph.	comparison to capsaicin
triglycerides	blood	rat	-	M	Mikhail, 1979, 196-G10	-
	aorta	rat	B	M	Latha, 1988, 1215-B12	increase
	blood	rat	A	M	Chow, 1982, 1393-A12	no effect; vitamin E
	serum	man	C	M	Craig, 1989, 1288-A1	increase: metaanalysis
	lipoprote in	rat	B	M	Latha, 1988, 1215-B12	increase

Remarks: Smoke type (TYPE): M: Mainstream, S: Sidestream  
Study type (EXP): A: acute, B: subchronic, C: chronic

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## TOBACCO SMOKE EFFECTS

PARAMETER	TISSUE	SPECIES	EXP	TYPE	SOURCE	REMARKS
triglycerides	heart	rat	B	M	Latha, 1988, 1215-B12	increase
	lung	rat	B	M	Latha, 1988, 1215-B12	increase
TSH	serum	rat	A	M	Andersson, 1987, 1024-A1	decrease
tumor cell killing	-	mouse	C	M	Holt, 1976, 822-C10	-
uracil DNA glyoxylase	free lung cells	man	C	M	Vaehaekang as, 1991,	no effect
urea nitrogen	serum	rat	B	M	Coggins, 1993, A2044	no effect
uterus tumors	-	man	C	M	Mathe, 1988, 1316-F4	epidemiology
VDP glucuronyltra nsferase	lungs	man	C	M	Petruzzell i, 1988, 1206-E10	increase
viscosity	blood	rat	-	M	Coates, 1978, 22-C8	-
vitamic C	blood	rat	A	M	Chow, 1982, 1393-A12	decrease; vitamin E
	lungs	rat	A	M	Chow, 1982, 1393-A12	no effect; vitamin E
vitamin B12	blood	man	C	M	Dastur, 1972, -	decrease
vitamin B2 concentration	blood	man	C	M	Sulsky, 1988, 1195-F14	decrease

Remarks: Smoke type (TYPE): M: Mainstream, S: Sidestream  
Study type (EXP): A: acute, B: subchronic, C: chronic

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## TOBACCO SMOKE EFFECTS

PARAMETER	TISSUE	SPECIES	EXP	TYPE	SOURCE	REMARKS
vitamin C	serum	man	C	M	Schectman, 1991, D4575	decrease
	plasma	man	C	M	Tribble, 1993, D10854	decrease
				E	Tribble, 1993, D10854	decrease
vitamin C concentration	lung	guinea pig	B	S	Airriess, 1988, 1143-A1	no effects
				M	Airriess, 1988, 1143-A1	no effects
	lungs	guinea pig	C	M	Chow, 1987, 1211-A2	no effect
	liver	guinea pig	C	S	Chow, 1987, 1211-A2	no effect
	lungs	rat	C	M	Chow, 1987, 1211-A2	no effect
	liver	rat	C	S	Chow, 1987, 1211-A2	no effect
	serum	man	C	M	Smith, 1987, 1213-G5	reduced vs. nonsmokers
	lungs	rat	C	S	Chow, 1987, 1211-A2	no effect
	liver	rat	C	M	Chow, 1987, 1211-A2	no effect
	lungs	guinea pig	C	S	Chow, 1987, 1211-A2	no effect

Remarks: Smoke type (TYPE): M: Mainstream, S: Sidestream  
 Study type (EXP): A: acute, B: subchronic, C: chronic

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## TOBACCO SMOKE EFFECTS

PARAMETER	TISSUE	SPECIES	EXP	TYPE	SOURCE	REMARKS
vitamin C concentration	liver	guinea pig	C	M	Chow, 1987, 1211-A2	no effect
vitamin C intake	-	man	C	M	Smith, 1987, 1213-G5 Tribble, 1993, D10854	decrease vs. nonsmokers decrease
				E	Tribble, 1993, D10854	no effect
vitamin E	blood	rat	A	M	Chow, 1982, 1393-A12	no effect; vitamin E
vitamin E concentration	lung	guinea pig	B	M	Airriess, 1988, 1143-A1	increase, no ef. liver, kidney
				S	Airriess, 1988, 1143-A1	increase, no ef. liver, kidney
	plasma	man	C	M	van Rensburg, 1989, 1395-G7	no effect
	LDL	man	C	M	Princen, 1992, -	no difference
volume, total lung		mouse	C	M	Matulionis, 1984, 348-C11	decrease
white blood cell count	blood	rat	A	M	Chow, 1982, 1393-A12	no effect; vitamin E
zoxazolamine paralysis time	-	rat	C	M	Grazians, 1984, 214-A12	no change
[4 <sup>-</sup> gen radicals	PMN leucocytes	man	C	M	Kalra, 1991, 1592-D13	increase (Zymosan)

Remarks: Smoke type (TYPE): M: Mainstream, S: Sidestream  
Study type (EXP): A: acute, B: subchronic, C: chronic

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